



# Measles Vaccination in Germany - An analysis of coverage rates concerning children younger than two years

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## Abstract

### Background:

Measles is a highly infectious viral illness, which is often accompanied by serious complications. Since there is no specific treatment for measles, the most effective strategy in order to stay healthy is to prevent an infection. Measles are effectively preventable through immunization. The WHO/Europe places a high priority on the elimination of this preventable but still dangerous disease. It is planned to achieve this goal in 2015. But therefore a rate of 95% measles vaccination coverage is necessary.

Up to this Point nationwide coverage rates are only available for children aged four to seven, but information about the extent of immunization-activities in kids younger than two years differentiated by administrative districts are nonexistent. Additionally the proportion of kids vaccinated within the officially (STIKO) recommended time-frame (age at first shot 9-14 months, age at second shot 15-23 months) and the resulting disparity in regional coverage rates are unknown

### Method:

The analysis is based on nationwide outpatient claims data from 2008 to 2010. All children who were born in 2008 and saw a doctor for the U4 preventive medical checkup (recommended during the 3<sup>rd</sup> and 4<sup>th</sup> month of life) where enrolled in the study population. Measles immunization was identified by specific digits of the medical fee schedule and the German vaccination guideline. In order to create a broad view on immunization activities two different analysis foci were established. For the calculation of the overall immunization rate all vaccinations given up to an age of 24 Months were taken into account. For the aspect of STIKO-compliance only vaccinations during the recommended time-frame where integrated in the analysis. Factors, which influence the regional coverage rate, were identified by running a generalized linear mixed model.

### Results:

85.5% of the study population get at least one measles immunization before their 2nd birthday and 69.4% of them receive the first vaccination during the STIKO-recommended period (9-14 months). These coverage rates are - though still below the important 95% WHO- threshold - quite remarkable, but for the also very important second vaccination the rates are much lower. Only 62.0% (59.8 % without Saxony who recommends the second shot at age 5) of the study population children get both vaccinations until they turn two and an even smaller amount of them (only 37.0%) is vaccinated in the recommended timeframe (9-14 months and 15-23 months)

On the federal perspective there are only small regional variations between the reached coverage rates for the first measles immunization (from 80.2 % in Saxony up to 89.3 % in Mecklenburg-Western Pomerania). Switching to community level the differences increase quite a bit and coverage rates range from 61.3 % in Rosenheim (Bavaria) to 94.8 % in Zweibrücken (Rhineland-Palatinate). The Highest

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Coverage rate for the second and therefore complete immunization reaches North Rhine-Westphalia with 66.7%. If Saxony is not taken into account because of their different immunization schedule, the federal state of Bavaria (56.4%) has the lowest coverage rates.

Using the generalized liner mixed model different factors, which affect the regional coverage rate significantly, were identified. The most prominent effect on the chance to get the first measles vaccination before the second birthday is evoked by the proportion of highly qualified women (OR 0,943 95 % CI 76 0,909-0,997).

**Conclusion:**

It is still a long way until the 95% population wide coverage rate for both measles vaccinations, which is one of the requirements for measles elimination, will be reached. Though there are many different reasons for a missing or late vaccination against measles one of the most important seems to be uncertainty of the risks and benefits of the measles vaccination. This fact points to the important role of pediatrics and family physicians. With complete and broad information about the risks of an infection and also the risks and benefits of an immunization the doctor can help to reduce doubts in parents and therefor contributes to a rising coverage rate